

SECTION: PC-3

PROTOCOL TITLE: PEDIATRIC Tachycardia

REVISED: August 1, 2013

BLS SPECIFIC CARE: See General Pediatric Care Protocol PC-1

- Determine patient's color category on length based resuscitation tape (Broselow Tape if available)

ILS SPECIFIC CARE: See General Pediatric Care Protocol PC-1

ALS SPECIFIC CARE: See General Pediatric Care Protocol PC-1

- *If Unstable/ poor perfusion:* Obtain a 12-lead if possible, otherwise proceed directly to synchronized cardioversion
- Consider underlying causes and treat as well
- See Protocol P-10 for sedation prior to cardioversion

Narrow Complex Tachycardia (Supraventricular, QRS \leq 0.08 sec, and regular):

- Vagal Maneuvers
- Adenosine
 - IV or IO: First dose: 0.1 mg/kg maximum: 6 mg
 - Subsequent doses: 0.2 mg/kg, maximum: 12 mg. Repeat once
- Diltiazem
 - IV/ IO: 0.25 mg/kg IV over 2 minutes (Usual dose about 20 mg)
 - May repeat in 15 minutes @ 0.35 mg/kg IV over 2 minutes.
 - Hold for WPW
- If unsuccessful, yet stable, contact medical control for further instructions. If unstable, proceed to synchronized cardioversion
- Assume non-cardiac causes of any tachycardia in infant patients presenting with heart rates < 220 bpm and child patients with heart rates < 180 bpm
- Maintain patent airway as necessary to include endotracheal intubation when appropriate
- Obtain 12-lead if time allows
- For hemodynamically **UNSTABLE** patients presenting with narrow or wide complex tachycardias, perform immediate synchronized DC cardioversion
 - In the pediatric patient population, a narrow QRS complex is defined as a complex with duration of < 0.08 sec (2 mm.)

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PED TACHYCARDIA

- Consider sedation prior to cardioversion if it will not cause unnecessary delays
 - DO NOT** administer if:
 - Signs and symptoms of shock are present
 - Low respiratory rate, SpO2 and/or diminished mental status
- Versed (midazolam)
 - 0.05 mg/kg to a maximum dose of 2.5 mg IV/IO

Synchronized DC cardioversion

- Initial energy setting of 0.5 J/kg or as per manufacturer's recommendations
- Deliver subsequent shocks, as needed, at 1 J/kg or as per manufacturer's recommendations
- **For hemodynamically STABLE patients presenting with narrow complex tachycardias, vagal maneuvers and antidysrhythmic therapy are indicated**

Antidysrhythmic

- **Adenocard (adenosine):**
 - DO NOT** administer to irregular tachycardias.
 - 0.1 mg/kg rapidly
 - Maximum initial dose of 6 mg
 - Use two syringe technique
 - If dysrhythmia is not terminated, repeat one more time at double the dose (0.2 mg/kg)
 - Maximum second dose of 12 mg
 - Use two syringe technique
- Follow each dose with a flush of at least 20 ml
- **Cardizem (diltiazem):*****
 - 0.25 mg/kg followed by 0.35 mg/kg in 15 minutes IV/IO

Wide Complex Tachycardia (QRS \geq 0.08sec, Variable R-R)

- Lidocaine
 - IV or IO: 1 mg/kg
 - Repeat every 3-5 minutes to a max dose of 3 mg/kg.
- Amiodarone
 - IV or IO: 5 mg/kg over 20-60 min. May repeat dose up to 15 mg/kg (max 300 mg).
- If unsuccessful, yet stable, contact medical control for further instructions. If unstable, proceed to synchronized cardioversion.

Synchronized Cardioversion

- Settings for synchronized Cardioversion:
 - 0.5 j/kg with subsequent shocks set at 1 j/kg
 - Ensure “**SYNC**” button is pressed between each desired synchronized shock
- Assume non-cardiac causes of any tachycardia in infant patients presenting with heart rates < 220 bpm and child patients with heart rates < 180 bpm
- Maintain patent airway as necessary to include endotracheal intubation when appropriate
- Obtain 12-lead if time allows
- For hemodynamically unstable patients presenting with wide or narrow complex tachycardias, perform immediate synchronized DC cardioversion
 - In the pediatric patient population, a wide QRS complex is defined as a complex with duration of > 0.08 sec (2 mm)
- Consider sedation prior to cardioversion if it will not cause unnecessary delays
 - DO NOT** administer if:

 - Signs and symptoms of shock are present
 - Low respiratory rate, SpO2 and/or diminished mental status
- Versed (midazolam):
 - 0.05 mg/kg to maximum single dose of 2.5 mg. IV/IO

Synchronized DC cardioversion:

- Initial energy setting of 0.5 J/kg or as per manufacturer's recommendations
- Deliver subsequent shocks, as needed, at 1 J/kg or as per manufacturer's recommendations
- If unable to obtain synchronization with QRS complexes, (as with torsades de pointes) proceed with **unsynchronized** cardioversion as detailed below

Unsynchronized DC cardioversion:

- For unstable torsades de pointes (polymorphic wide complex tachycardia)
 - Use unsynchronized defibrillation energy settings
 - Initial energy setting of 2J/kg or as per manufacturer's recommendations
 - Deliver subsequent shocks, as needed, at 4 J/kg or as per manufacturer's recommendations

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PED TACHYCARDIA

For hemodynamically STABLE patients presenting with wide complex tachycardias, antidysrhythmic therapy is indicated

Antidysrhythmic therapy:

- **Lidocaine IV/IO/ETT:**
 - 1 mg/kg initial bolus
 - Repeat every 5-10 minutes to a maximum of 3 mg/kg
- Magnesium sulfate: IV/IO
 - First line agent in treatment of hemodynamically stable polymorphic wide complex tachycardia (torsades de pointes)
 - Also indicated in treatment of refractory VF, wide complex tachycardia in the presence of suspected hypomagnesemia and life threatening ventricular dysrhythmias due to suspected digitalis toxicity
 - 25-50 mg/kg (to a maximum of 2 g) over 10 minutes
 - Rapid administration of magnesium sulfate can cause hypotension and respiratory depression. Carefully monitor both during infusion
- To prepare:
 - Dilute calculated quantity of magnesium sulfate to 50 ml with NS in burette of Metriset
 - Start infusion with roller-clamp half open and titrate to rate of approximately 5 ml/minute

PHYSICIAN PEARLS:

- **Amiodarone is contraindicated if the patient is suspected of a TCA overdose.** This also applies to other drugs that widen the QRS

Use of a vagal maneuver may be useful in determining type of rhythm.

QRS Width:

≤ 0.08 seconds –probable Sinus Tachycardia or Supraventricular Tachycardia
≥ 0.08 seconds –probable Ventricular Tachycardia

Rate: (rates less than 180 BPM in a child, or 220 infant are usually secondary to other non-cardiac causes)

< 180 in Children or < 220 BPM in Infants with regular R-R: Probable Sinus Tach.

> 180 in Children or > 220 BPM in Infants with regular R-R: SVT

> 180 in Children or > 220 BPM in Infants with Variable R-R pattern: VT